Metal Film Fixed Resistors
Axial Leaded

multicomp PRO

RoHS Compliant

Specifications:

Type	: Metal Flim
Rated Power	: 1/8W (0.125W)
Max. Working Voltage	: 200V or √PxR whichever lesser
Max. Overload Voltage	: 400V or 2.5√PxR whichever lesser
Dielectric Withstanding Voltage	: 200V
Rated Ambient Temp	: 70°C
Operating Temp. Range	: -55°C to +155°C
Resistance Tolerance	: ±2%
Resistance Range	: 2.2Ω to 1MΩ

Power Rating

Resistors shall have a power rating based on continuous full load operation at an ambient temperature of 70°C.
For temperature in excess of 70°C, the load shall be derated as shown in the below figure.

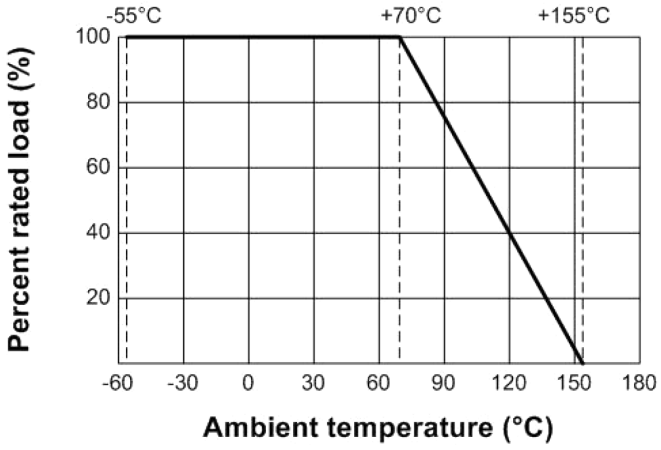
Voltage Rating:

Resistors shall have a rated direct-current (DC) continuous working voltage or an approximate sine-wave root-mean-square (RMS) alternating-current (AC) continuous working voltage at commercialline frequency and waveform curresponding to the power rating , as determined from the following formula:

$$RCWV = \sqrt{P \times R}$$

Were : RCWV = Rated DC or RMS AC continuous working voltage at commercial-line frequency and waveform (V)
P = Power Rating (W)
R = Nominal Resistance (Ω)

In no case shall the rated DC or RMS AC continuous working voltage be greater than the applicable maximum value.



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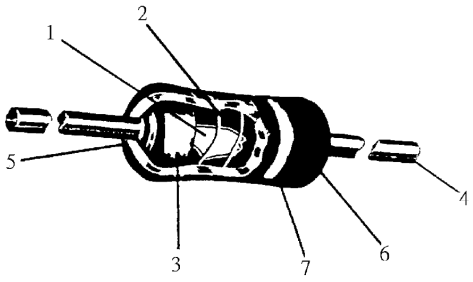
Construction



No	Name	Material
1	Basic Body	Rod Type Ceramics
2	Resistance Film	Metal Film
3	End Cap	Steel (Tin plated iron surface)
4	Lead Wire	Annealed copper wire coated with tin
5	Joint	By Welding
6	Coating	Non-Flame Paint (Colour: Green Meeting UL94V-0 Standard)
7	Colour Code	Epoxy Resin

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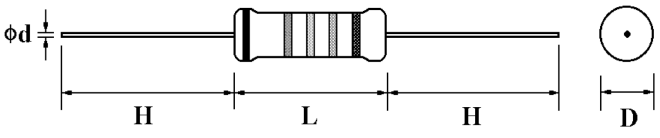
Characteristics	Limits	Test Methods(JIS C 5201-1)
DC. resistance	Must be within the specified tolerance	The limit of error of measuring apparatus shall not exceed allowable range or 1% of resistance tolerance
Insulation resistance	Insulation resistance is 10,000MΩ Min.	Resistors shall be clamped in the trough of a 90° metallic V-block or foil method use a metal foil shall be wrapped closely around the body of the resistor. After that shall be tested at DC potential respectively specified in the above list for 60 +10/-0 secs.
Dielectric withstanding voltage	No evidence of flashover mechanical damage, arcing or insulation break down	Resistors shall be clamped in the trough of a 90° metallic V-block or foil method use a metal foil shall be wrapped closely around the body of the resistor. After that shall be tested at AC potential respectively specified in the table 1. for 60 +10/-0 secs.
Temperature coefficient	Within the temperature coefficient specified below :± 50 PPM/°C Max.	Natural resistance change per temp. degree centigrade $\frac{R_2-R_1}{R_{1(t2-t1)}} \times 10^6$ (PPM/°C) R1: Resistance value at room temperature (t1) R2: Resistance value at room temp. plus 100°C (t2)
Short time overload	Resistance change rate is ± (0.5% + 0.05Ω) Max. with no evidence of mechanical damage	Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds
Terminal strength	No evidence of mechanical damage	**Direct load:** Resistance to a 2.5 kgs direct load for 10secs. in the direction of the longitudinal axis of the terminal leads **Twist test :** Terminal leads shall be bent through 90 ° at a point of about 6mm from the body of the resistor and shall be rotated through 360° about the original axis of the bent terminal in alternating direction for a total of 3 rotations
Solderability	95% coverage Min.	The area covered with a new, smooth,clean, shiny and continuous surface free from concentrated pinholes. Test temp. of solder : 245°C ± 3°C Dwell time in solder : 2 ~ 3 seconds

<table>
<tr><th>Characteristics</th><th>Limits</th><th>Test Methods(JIS C 5201-1)</th></tr>
<tr><td>Soldering temp. reference</td><td>Electrical characteristics shall be satisfied. Without distinct deformation in appearance.
(95 % coverage Min.)</td><td>The leads immersed into solder bath to 3.2 to 4.8 mm. from the body. Permanent resistance change shall be checked.
<u>Wave soldering condition: (2 cycles Max.)</u>
Pre-heat : 100 ~ 120°C, 30 ± 5 sec.
Suggestion solder temp.: 235 ~ 255°C, 10 sec. (Max.)
Peak temp.: 260°C
<u>Hand soldering condition:</u>
Hand Soldering bit temp. : 380 ± 10°C
Dwell time in solder : 3 +1/-0 sec.</td></tr>
<tr><td>Resistance to soldering heat</td><td>Resistance change rate is ±(1% + 0.05Ω) Max. with no evidence of mechanical damage</td><td>Permanent resistance change when leads immersed to 3.2mm to 4.8mm from the body in 350°C ± 10°C solder for 3 ±0.5 seconds</td></tr>
<tr><td>Temperature Cycling</td><td>Resistance change rate is ±(1% + 0.05Ω) Max. with no evidence of mechanical damage</td><td>Resistance change after continuous 5 cycles for duty shown below:
<table>
<tr><th>Step</th><th>Temperature</th><th>Time</th></tr>
<tr><td>1</td><td>-55°C ±3°C</td><td>30 mins</td></tr>
<tr><td>2</td><td>Room temp.</td><td>10~15 mins</td></tr>
<tr><td>3</td><td>+155°C ±2°C</td><td>30 mins</td></tr>
<tr><td>4</td><td>Room temp.</td><td>10~15 mins</td></tr>
</table></td></tr>
<tr><td>Vibration</td><td>Resistance change rate is ±(1% + 0.05Ω) Max.</td><td>55Hz, 3 planes 2hrs each
Total amplitude = 1.5mm</td></tr>
<tr><td>Load life in humidity</td><td>Resistance value | ΔR/R
Non-Flame type | ±5%</td><td>Resistance change after 1,000 hours
(1.5 hours “on”, 0.5 hour “off”) at RCWV in a humidity test chamber controlled at 40°C
±2°C and 90 to 95 % relative humidity</td></tr>
<tr><td>Load life</td><td>Resistance value | ΔR/R
Non-Flame type | ±5%</td><td>Permanent resistance change after
1,000 hours operating at RCWV with duty cycle of
70°C ±2°C ambient</td></tr>
<tr><td>Resistance to solvent</td><td>No deterioration of protective coatings and markings</td><td>Specimens shall be immersed in a bath of trichroethane completely for 3 minutes with ultrasonic</td></tr>
<tr><td>Pulse overload</td><td>Resistance change rate is ±(1% + 0.05Ω) Max. with no evidence of mechanical damage</td><td>Resistance change after 10,000 cycles
(1 sec. “on” , 25 secs. “off”) at 4 times RCWV</td></tr>
</table>

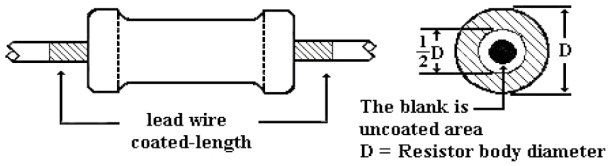
Dimension



Power Rating	D (Max.)	L (Max.)	d ± 0.05	H ± 3
1/8W	1.85mm	3.5mm	0.45mm	28mm

Painting method

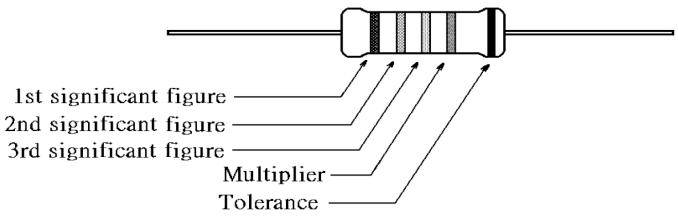
Welding point, terminal and lead wire, is permissible to be exposed without the outer coated cover.
The extent should be within 1/2 of the are angle.



Marking

Resistor

Resistors shall be marked with colour coding
colours shall be in accordance with JIS C 0802



2. Label

Label shall be marked with following items:

1. Type and style
2. Nominal resistance
3. Resistance tolerance
4. Quantity
5. Lot number
6. PPM

Part Number Table

Description	Part Number	Description	Part Number
Axial Leaded Metal Film Resistor, 1/8W, 2.2R, ±2%	MP006658	Axial Leaded Metal Film Resistor, 1/8W, 11R, ±2%	MP006675
Axial Leaded Metal Film Resistor, 1/8W, 2.4R, ±2%	MP006659	Axial Leaded Metal Film Resistor, 1/8W, 12R, ±2%	MP006676
Axial Leaded Metal Film Resistor, 1/8W, 2.7R, ±2%	MP006660	Axial Leaded Metal Film Resistor, 1/8W, 13R, ±2%	MP006677
Axial Leaded Metal Film Resistor, 1/8W, 3R, ±2%	MP006661	Axial Leaded Metal Film Resistor, 1/8W, 15R, ±2%	MP006678
Axial Leaded Metal Film Resistor, 1/8W, 3.3R, ±2%	MP006662	Axial Leaded Metal Film Resistor, 1/8W, 16R, ±2%	MP006679
Axial Leaded Metal Film Resistor, 1/8W, 3.6R, ±2%	MP006663	Axial Leaded Metal Film Resistor, 1/8W, 18R, ±2%	MP006680
Axial Leaded Metal Film Resistor, 1/8W, 3.9R, ±2%	MP006664	Axial Leaded Metal Film Resistor, 1/8W, 20R, ±2%	MP006681
Axial Leaded Metal Film Resistor, 1/8W, 4.3R, ±2%	MP006665	Axial Leaded Metal Film Resistor, 1/8W, 22R, ±2%	MP006682
Axial Leaded Metal Film Resistor, 1/8W, 4.7R, ±2%	MP006666	Axial Leaded Metal Film Resistor, 1/8W, 24R, ±2%	MP006683
Axial Leaded Metal Film Resistor, 1/8W, 5.1R, ±2%	MP006667	Axial Leaded Metal Film Resistor, 1/8W, 27R, ±2%	MP006684
Axial Leaded Metal Film Resistor, 1/8W, 5.6R, ±2%	MP006668	Axial Leaded Metal Film Resistor, 1/8W, 30R, ±2%	MP006685
Axial Leaded Metal Film Resistor, 1/8W, 6.2R, ±2%	MP006669	Axial Leaded Metal Film Resistor, 1/8W, 33R, ±2%	MP006686
Axial Leaded Metal Film Resistor, 1/8W, 6.8R, ±2%	MP006670	Axial Leaded Metal Film Resistor, 1/8W, 36R, ±2%	MP006687
Axial Leaded Metal Film Resistor, 1/8W, 7.5R, ±2%	MP006671	Axial Leaded Metal Film Resistor, 1/8W, 39R, ±2%	MP006688
Axial Leaded Metal Film Resistor, 1/8W, 8.2R, ±2%	MP006672	Axial Leaded Metal Film Resistor, 1/8W, 43R, ±2%	MP006689
Axial Leaded Metal Film Resistor, 1/8W, 9.1R, ±2%	MP006673	Axial Leaded Metal Film Resistor, 1/8W, 47R, ±2%	MP006690
Axial Leaded Metal Film Resistor, 1/8W, 10R, ±2%	MP006674	Axial Leaded Metal Film Resistor, 1/8W, 51R, ±2%	MP006691

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Axial Leaded Metal Film Resistor, 1/8W, 56R, ±2%	MP006692
Axial Leaded Metal Film Resistor, 1/8W, 62R, ±2%	MP006693
Axial Leaded Metal Film Resistor, 1/8W, 68R, ±2%	MP006694
Axial Leaded Metal Film Resistor, 1/8W, 75R, ±2%	MP006695
Axial Leaded Metal Film Resistor, 1/8W, 82R, ±2%	MP006696
Axial Leaded Metal Film Resistor, 1/8W, 91R, ±2%	MP006697
Axial Leaded Metal Film Resistor, 1/8W, 100R, ±2%	MP006698
Axial Leaded Metal Film Resistor, 1/8W, 110R, ±2%	MP006699
Axial Leaded Metal Film Resistor, 1/8W, 120R, ±2%	MP006700
Axial Leaded Metal Film Resistor, 1/8W, 130R, ±2%	MP006701
Axial Leaded Metal Film Resistor, 1/8W, 150R, ±2%	MP006702
Axial Leaded Metal Film Resistor, 1/8W, 160R, ±2%	MP006703
Axial Leaded Metal Film Resistor, 1/8W, 180R, ±2%	MP006704
Axial Leaded Metal Film Resistor, 1/8W, 200R, ±2%	MP006705
Axial Leaded Metal Film Resistor, 1/8W, 220R, ±2%	MP006706
Axial Leaded Metal Film Resistor, 1/8W, 240R, ±2%	MP006707
Axial Leaded Metal Film Resistor, 1/8W, 270R, ±2%	MP006708
Axial Leaded Metal Film Resistor, 1/8W, 300R, ±2%	MP006709
Axial Leaded Metal Film Resistor, 1/8W, 330R, ±2%	MP006710
Axial Leaded Metal Film Resistor, 1/8W, 360R, ±2%	MP006711
Axial Leaded Metal Film Resistor, 1/8W, 390R, ±2%	MP006712
Axial Leaded Metal Film Resistor, 1/8W, 430R, ±2%	MP006713
Axial Leaded Metal Film Resistor, 1/8W, 470R, ±2%	MP006714
Axial Leaded Metal Film Resistor, 1/8W, 510R, ±2%	MP006715
Axial Leaded Metal Film Resistor, 1/8W, 560R, ±2%	MP006716
Axial Leaded Metal Film Resistor, 1/8W, 620R, ±2%	MP006717
Axial Leaded Metal Film Resistor, 1/8W, 680R, ±2%	MP006718
Axial Leaded Metal Film Resistor, 1/8W, 750R, ±2%	MP006719
Axial Leaded Metal Film Resistor, 1/8W, 820R, ±2%	MP006720
Axial Leaded Metal Film Resistor, 1/8W, 910R, ±2%	MP006721
Axial Leaded Metal Film Resistor, 1/8W, 1K, ±2%	MP006722
Axial Leaded Metal Film Resistor, 1/8W, 1.1K, ±2%	MP006723
Axial Leaded Metal Film Resistor, 1/8W, 1.2K, ±2%	MP006724
Axial Leaded Metal Film Resistor, 1/8W, 1.3K, ±2%	MP006725
Axial Leaded Metal Film Resistor, 1/8W, 1.4K, ±2%	MP006726
Axial Leaded Metal Film Resistor, 1/8W, 1.6K, ±2%	MP006727
Axial Leaded Metal Film Resistor, 1/8W, 1.8K, ±2%	MP006728
Axial Leaded Metal Film Resistor, 1/8W, 2K, ±2%	MP006729
Axial Leaded Metal Film Resistor, 1/8W, 2.2K, ±2%	MP006730
Axial Leaded Metal Film Resistor, 1/8W, 2.4K, ±2%	MP006731

Description	Part Number
Axial Leaded Metal Film Resistor, 1/8W, 2.7K, ±2%	MP006732
Axial Leaded Metal Film Resistor, 1/8W, 3K, ±2%	MP006733
Axial Leaded Metal Film Resistor, 1/8W, 3.3K, ±2%	MP006734
Axial Leaded Metal Film Resistor, 1/8W, 3.6K, ±2%	MP006735
Axial Leaded Metal Film Resistor, 1/8W, 3.9K, ±2%	MP006736
Axial Leaded Metal Film Resistor, 1/8W, 4.3K, ±2%	MP006737
Axial Leaded Metal Film Resistor, 1/8W, 4.7K, ±2%	MP006738
Axial Leaded Metal Film Resistor, 1/8W, 5.1K, ±2%	MP006739
Axial Leaded Metal Film Resistor, 1/8W, 5.6K, ±2%	MP006740
Axial Leaded Metal Film Resistor, 1/8W, 6.2K, ±2%	MP006741
Axial Leaded Metal Film Resistor, 1/8W, 6.8K, ±2%	MP006742
Axial Leaded Metal Film Resistor, 1/8W, 7.5K, ±2%	MP006743
Axial Leaded Metal Film Resistor, 1/8W, 8.2K, ±2%	MP006744
Axial Leaded Metal Film Resistor, 1/8W, 9.1K, ±2%	MP006745
Axial Leaded Metal Film Resistor, 1/8W, 10K, ±2%	MP006746
Axial Leaded Metal Film Resistor, 1/8W, 11K, ±2%	MP006747
Axial Leaded Metal Film Resistor, 1/8W, 12K, ±2%	MP006748
Axial Leaded Metal Film Resistor, 1/8W, 13K, ±2%	MP006749
Axial Leaded Metal Film Resistor, 1/8W, 15K, ±2%	MP006750
Axial Leaded Metal Film Resistor, 1/8W, 16K, ±2%	MP006751
Axial Leaded Metal Film Resistor, 1/8W, 18K, ±2%	MP006752
Axial Leaded Metal Film Resistor, 1/8W, 20K, ±2%	MP006753
Axial Leaded Metal Film Resistor, 1/8W, 22K, ±2%	MP006754
Axial Leaded Metal Film Resistor, 1/8W, 24K, ±2%	MP006755
Axial Leaded Metal Film Resistor, 1/8W, 27K, ±2%	MP006756
Axial Leaded Metal Film Resistor, 1/8W, 30K, ±2%	MP006757
Axial Leaded Metal Film Resistor, 1/8W, 33K, ±2%	MP006758
Axial Leaded Metal Film Resistor, 1/8W, 36K, ±2%	MP006759
Axial Leaded Metal Film Resistor, 1/8W, 39K, ±2%	MP006760
Axial Leaded Metal Film Resistor, 1/8W, 43K, ±2%	MP006761
Axial Leaded Metal Film Resistor, 1/8W, 47K, ±2%	MP006762
Axial Leaded Metal Film Resistor, 1/8W, 51K, ±2%	MP006763
Axial Leaded Metal Film Resistor, 1/8W, 56K, ±2%	MP006764
Axial Leaded Metal Film Resistor, 1/8W, 62K, ±2%	MP006765
Axial Leaded Metal Film Resistor, 1/8W, 68K, ±2%	MP006766
Axial Leaded Metal Film Resistor, 1/8W, 75K, ±2%	MP006767
Axial Leaded Metal Film Resistor, 1/8W, 82K, ±2%	MP006768
Axial Leaded Metal Film Resistor, 1/8W, 91K, ±2%	MP006769
Axial Leaded Metal Film Resistor, 1/8W, 100K, ±2%	MP006770
Axial Leaded Metal Film Resistor, 1/8W, 110K, ±2%	MP006771

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Axial Leaded Metal Film Resistor, 1/8W, 120K, ±2%	MP006772
Axial Leaded Metal Film Resistor, 1/8W, 130K, ±2%	MP006773
Axial Leaded Metal Film Resistor, 1/8W, 150K, ±2%	MP006774
Axial Leaded Metal Film Resistor, 1/8W, 160K, ±2%	MP006775
Axial Leaded Metal Film Resistor, 1/8W, 180K, ±2%	MP006776
Axial Leaded Metal Film Resistor, 1/8W, 200K, ±2%	MP006777
Axial Leaded Metal Film Resistor, 1/8W, 220K, ±2%	MP006778
Axial Leaded Metal Film Resistor, 1/8W, 240K, ±2%	MP006779
Axial Leaded Metal Film Resistor, 1/8W, 270K, ±2%	MP006780
Axial Leaded Metal Film Resistor, 1/8W, 300K, ±2%	MP006781
Axial Leaded Metal Film Resistor, 1/8W, 330K, ±2%	MP006782
Axial Leaded Metal Film Resistor, 1/8W, 360K, ±2%	MP006783

Description	Part Number
Axial Leaded Metal Film Resistor, 1/8W, 390K, ±2%	MP006784
Axial Leaded Metal Film Resistor, 1/8W, 430K, ±2%	MP006785
Axial Leaded Metal Film Resistor, 1/8W, 470K, ±2%	MP006786
Axial Leaded Metal Film Resistor, 1/8W, 510K, ±2%	MP006787
Axial Leaded Metal Film Resistor, 1/8W, 560K, ±2%	MP006788
Axial Leaded Metal Film Resistor, 1/8W, 620K, ±2%	MP006789
Axial Leaded Metal Film Resistor, 1/8W, 680K, ±2%	MP006790
Axial Leaded Metal Film Resistor, 1/8W, 750K, ±2%	MP006791
Axial Leaded Metal Film Resistor, 1/8W, 820K, ±2%	MP006792
Axial Leaded Metal Film Resistor, 1/8W, 910K, ±2%	MP006793
Axial Leaded Metal Film Resistor, 1/8W, 1M, ±2%	MP006794